28. $3\log_7 3 - \frac{1}{4}\log_7 81 = \log_7 x$

$\log_7 3^3 - \log_7 81^{\frac{1}{4}} =$

$\log_7 27 - \log_7 3 =$

$\log_7 \frac{27}{3} =$

$\log_7 9 = \log_7 x$

$9 = x$

33 $\log 9^{3x} = \log 4^{5x+2}$

$3x \log 9 = (5x+2) \log 4$

$3x \log 9 = 5x \log 4 + 2 \log 4$

$3x \log 9 - 5x \log 4 = 2 \log 4$

$\frac{x(3\log 9 - 5\log 4) = 2\log 4}{3\log 9 - 5\log 4}$

$x = \frac{2\log 4}{3\log 9 - 5\log 4}$

$x \approx$

37. $2e^{3x} + 4 = 34$

$2e^{3x} = 30$

$\ln e^{3x} = \ln 15$

$\cancel{3x \ln e}$

$3x = \ln 15$

$x = \frac{\ln 15}{3}$

$x \approx$

5. (-1,6) and (0,3)

$\frac{6}{3} = \frac{3(b)^{-1}}{3}$

$2 = b^{-1}$

$2 = \frac{1}{b}$

$2b = 1$

$b = \frac{1}{2}$

$y = 3\left(\frac{1}{2}\right)^x$

35. $\ln(x+3)=1$

$e^1 = x+3$

$e-3 = x$

$\approx x$

42. A certain medication is eliminated from the bloodstream at a steady rate. It decays according to the equation $y = ae^{-0.1375t}$, where t is in hours. If the nurse administers 400 milligrams of the medication, how long will it take for the amount of medication in the bloodstream to be below 30 milligrams?

$\frac{30 = 400e^{-.1375t}}{400}$

$\ln .075 = \ln e^{-.1375t}$

$\frac{\ln .075 = -.1375t}{-.1375}$

19 hrs $\approx t$

39. There are currently 850 students at the high school. The district plans an addition that will hold 400 more students. If the school population grows at 7.8% per year, in how many years will the new addition be full?

$$y = a(1+r)^t$$

$$\frac{1250 = 850(1+.078)^t}{850}$$

$$\ln \frac{1250}{850} = \ln 1.078^t$$

$$\frac{\ln\left(\frac{1250}{850}\right) = t \ln 1.078}{\ln 1.078}$$

$$\frac{\ln\left(\frac{1250}{850}\right)}{\ln 1.078} = t$$

$$5.135 \text{ yrs} \approx t$$

6 yrs